

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
10 February 2005 (10.02.2005)

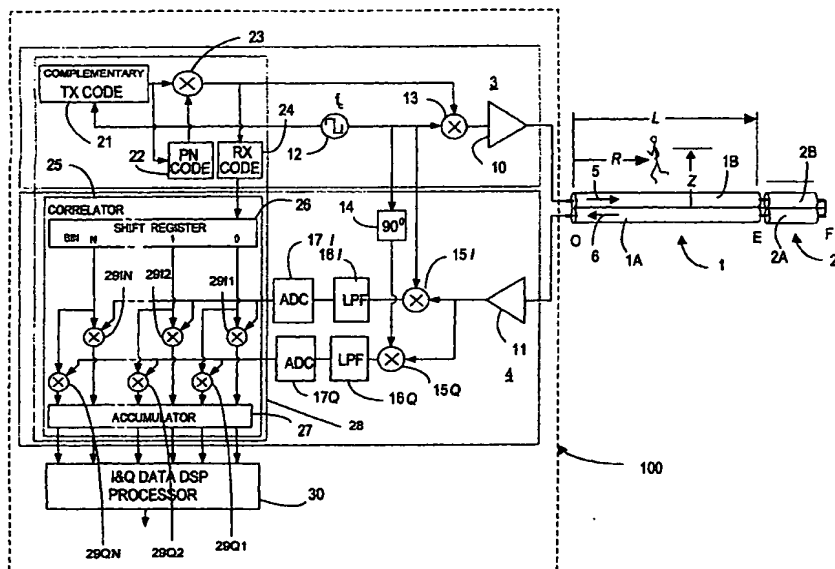
PCT

(10) International Publication Number
WO 2005/013223 A1

- (51) International Patent Classification⁷: **G08B 13/14, H01Q 13/20**
- (21) International Application Number: **PCT/CA2004/001438**
- (22) International Filing Date: **2 August 2004 (02.08.2004)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data: **60/491,548 1 August 2003 (01.08.2003) US**
- (71) Applicant (for all designated States except US): **SEN-STAR-STELLAR CORPORATION [CA/CA]; 119 John Cavanaugh Drive, Carp, Ontario K0A 1L0 (CA).**
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **HARMAN, Robert, Keith [CA/CA]; 4218 Hamilton Side Road, R.R. 4, Almonte, Ontario K0A 1A0 (CA).**
- (74) Agents: **WILKES, Robert, A. et al.; P.O. Box 3440, Station D, Ottawa, Ontario K1P 6P1 (CA).**
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.**
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): **ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).**

[Continued on next page]

(54) Title: **CABLE GUIDED INTRUSION DETECTION SENSOR, SYSTEM AND METHOD**



(57) Abstract: The present invention provides an intrusion detecting system and method for precisely locating an intruder along the length of a sensor cable and for determining the intruder distance from the cable to precisely locate multiple, simultaneously occurring intrusions. The method includes the steps of: generating a TX signal and transmitting same over a first transmission line of the sensor cable, for creating an electromagnetic field; detecting an RX signal induced in a second transmission line of the cable by the electromagnetic field and identifying in the RX signal a contra-directional reflection received from a target and a co-directional reflection received from the far-end (F) of the first transmission line, processing the contra-directional reflection for providing a first coordinate (R) of the target, and

processing the co-directional reflection for providing a second coordinate (Z) of the target. The method and system may also be implemented with a "true one cable" using a single coaxial cable sensor with a directional coupler for separating coupled signals along a single transmission line in the cable. Ultra high speed data correlation of the RX signal is achieved through use of a field programmable gate array. The present invention also provides a separate calibrated threshold for every meter of cable to reduce the installation cost associated with meticulous control and the number of cables required for sites with varying burial mediums. In another embodiment, the use of two parallel single cables may be utilized whereby each cable in the system is used to detect and locate intruders independently and more clearly define the direction of crossing and the speed of crossing.



Declaration under Rule 4.17:

— *of inventorship (Rule 4.17(iv)) for US only*

Published:

— *with international search report*

— *with amended claims*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.